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A Comparison of Researcher's Reference Management Software: Refworks, Mendeley, and EndNote

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Abstract: This paper aimed to present a comparison of researcher's reference management software such as RefWorks, Mendeley, and EndNote. This aim was achieved by comparing three software. The main results of this paper were concluded by comparing three software based on the experiment. The novelty of this paper is the comparison of researcher's reference management software and it has showed that Mendeley reference management software can import more data from the Google Scholar for researchers. This finding could help to know researchers to use the reference management software.

Keywords: *Reference management software, comparison and researchers*

1. Introduction

Reference management software maintains a database to references and creates bibliographies and the reference lists for the written works. It makes easy to read and to record the elements for the reference comprises such as the author's name, year of publication, and the title of an article, etc. (Reiss & Reiss, 2002). Reference Management Software is usually used by researchers, technologists, scientists, and authors, etc. to keep their records and utilize the bibliographic citations; hence it is one of the most complicated aspects among researchers. Formatting references as a matter of fact depends on a variety of citation styles which have been made the citation manager very essential for researchers at all levels (Gilmour & Cobus-Kuo, 2011). Reference management software is popularly known as bibliographic software, citation management software or personal bibliographic file managers (Nashelsky & Earley, 1991). Reference management software also helps to construct the customized databases of literature references and manage the citation and formatting of a list of references, and insert new citation into a seamless operation (Curry & Gray, 2008). The use of reference management software package established among researchers and students as a time saving tool for writing their academic papers (Fitzgibbons & Meert, 2010). The purpose of reference management software is to store, organize, and format references within the manuscript (Steele, 2008), and with the reference management tool researchers easily can keep track of their scientific literature they have read, and facilitate to edit for the scientific papers they write (Francese, 2012). Reference management software reduces the workload burden for the researchers to edit, proofread, and avoid formatting errors (Aronsky et al., 2005). The main purpose of the bibliographic references management software is to organize the information about the materials on the given subject which helps readers to access it (International Committee, 1999). According to the Telstar's (Technology Enhanced Learning supporting Students to achieve Academic Rigour) definition, the reference management software has two main functions, namely, building a database of the citation for the researchers to organize their documents, and to format the bibliographies and citations for writing papers via plug-ins or add-ons for the Word processing software.

According to Francese (2013), important features which relate to the very nature of a "global information infrastructure" (Borgman, 2003) as a place of the continuous and the seamless interaction and integration: citations are shared, discussed, commented, and suggested within the members of a scientific community. Francese (2013) also stated that reference management software acts as a virtual research environment or a platform for the "collaborator" (Bos, 2007; Voss & Procter, 2009), and adopt the feature of the virtual web collaboration networks such as the academic social bookmarking (Fourie, 2011). According to Jose & Jayakanth (2008), the reference management software maintains a back-end database of the reference details and provides the user interface which can facilitate in searching and rendering of references according to the desired styles. The typical functions of the reference management software includes import references from the variety of sources, for example, bibliographic databases; search, edit, sort, and the share references; render the references in the variety of formats; select the reference to incorporate in the word-processed document and the format automatically; and

finally, it stores the links for the documents or copies within the database. The purpose of this study was to determine the extent to which authors are using the reference management software for the systematic reviews, and to identify the software frequently used.

Problem Statement: Accurate references are very important for researchers when a computer search is needed with regard to searching a correct journal title because it can be a major obstacle for retrieving information from a computer since it cannot recognize any inaccuracies, for example, the misspelling of an author's name cannot be recognized by a computer (Hinchcliff et al., 1993).However, these inaccuracy errors include misspelling of an author's name, the wrong journal, and wrong page number(s) were usually considered to be a major issue (Hinchcliff et al., 1993). Errors can be the obstacle to retrieve the original source of publication because a computer cannot recognize any sort of errors, for example, author's name, article title (Orlin et al., 1996; Hernon & Metoyer-Duran, 1992), incomplete or misleading titles of works, proper use of abbreviations in relation to variations, wrong volume, edition numbers, incorrect pagination, and the publication years (Hernon & Metoyer-Duran, 1992), or a misspelling when the search is done on a computer (Orlin et al., 1996) and "inaccurate quotations and citations are displeasing for the original authors, misleading for the reader, and mean that untruths become 'accepted fact'"(De Lacey et al., 1985).

Gatten (2010) examined the 217 articles in three fashion journals and each reference was verified with the original source of article in six fields such as article title, author name(s), journal title, pagination, volume and year. The researcher reported that 49.3% errors contained in references in 107 articles, yielding a total errors of 142. On the other hand, Adhikari & Bhandari (2011) examined of 60 references articles published in the Internet Journal of Medical Update and reported that 10% references were inaccurate. The high inaccuracy references in the medical literature (Reddy et al., 2008; Mohammad & Laskin, 2008; Celayir et al., 2003; Evans et al., 1990) remains a significant problem. A study evaluated by Browne et al. (2004) in the reference citations in major 2 radiology journals showed a vast error rate of 2% and a minor error rate of 45% for the *American Journal of Roentgenology (AJR)*, with Radiology got a major error rate of 2% and a minor error rate of 23%. O'Connor & Kristof (2001) assessed 4,851 references from 93 articles which were published in 1998 and out of 93 journals a total of 12 journals were from business and economic journals and these researchers concluded that an average of 41.7% of references having at least one error, with majority of errors pertaining to authors' names, followed by errors pagination, errors in article or in the chapter titles. Another study by Wager and Middleton (2002) concluded that an accuracy in medical journals got 36% of a median prevalence of citation errors and 20% of median prevalence of quotation errors. Finally, Faunce & Soames (2001) examined accuracy for the references in five experimental psychology journals and they concluded that errors in the article title (15%), authors (12%), page numbers (6%), volume numbers (3%), and the journal title (2%).

Aim and Objective: The aim of this study is to compare researchers' reference management software to see which tool produce systematic review with more accuracy for researchers. This aim is achieved through the specific objectives: to identify the software which is more accurate in terms of importing information (fields) for the citations, references, and ease of use; to identify the similarities for the fields of the reference management software.

2. Literature Review

The aim of this section is to present existing literature on the systematic reviews for the researcher's reference management software through electronic database searching, duplicate records identification and elimination from multiple database searches, transfer references to Cochrane RefMan and other review software (Senarath, 2007; Steele, 2008). Studies conducted by Senarath (2007) and Steele (2008) found from 78 respondents who participated in their survey and reported that 79.5% had used reference management tool for their review. Furthermore, their studies also showed that 4.8% of the respondents usages in their published studies. Reference management software tools such as EndNote, Reference Manager, and RefWorks were used by 98% of authors (Lorenzetti & Ghali, 2013). A systematic review is needed for identification, collection, and organization for the similar studies and a "rigorous data management plan" is essential (King et al., 2011).However, in a more recent study, Lorenzetti &Ghali, (2013) found that of the total 78 researchers responded to their survey and they concluded that 79.5% had used the reference management tool package to prepare to their review. Furthermore, they also reported that 4.8% used reference management software in their published studies and their choice of tool was EndNote, Reference Manager, and RefWorks.

According to EndNote Application Story (n. d), 22 international scientists who have used reference management software and published their experience on the website for specific software. EndNote (9.0) research showed that the reference management software always helps authors to format their references according to the citation style needed by the respective bio-medical journals. Another study conducted by Brahmi & Gall (2006) concluded that this tool is very much useful for authors and editors in the biomedical journals. In addition, the study by Shaplaned (1999) and Eapen (2006) found that direct downloading facility can facilitate researchers for the collection of references rapidly, more accurately, and more correctly. King et al. (2011) found that the reference management software not only organizes and stores search results, but also appraises and code search results to track researchers' for the systematic review. Studies conducted by Egger et al. (n. d), Reeves et al. (2002), Best Evidence Medical Education (2009), Haig & Dozier (2003a, b), Dornan et al. (2006), Buckley et al. (2009), Hammick et al. (2010) concluded that, the reference management software are very important tools to manage the large amount of references from the search.

Product Information

RefWorks: RefWorks was founded in 2001 (Gilmour &Cobus-Kuo, 2011) and it is primarily used in academic libraries. According to Rapp (2011), RefWorks is very helpful for researchers because it is easy to use for data import, collaboration, and formatting. Most of the database vendors adopted their interface easily into the RefWorks. Researchers can easily import their references by using RefWorks from library catalogues, websites, and other citation managers. Furthermore, researchers can also easily upload files up to a 100MB limit and the administrator can increase this limit up to 5 GB by RefWorks (Hensley, 2011).

Mendeley: According to Francese (2012), Mendeley came out in the market in 2008 and it is a web-social-oriented software and it is always online for the users. The users can save their profiles, can build a database of citations; furthermore, it has until May 2012 counted more than 150 million references collected by more than 1.6 million users. According to Rapp (2011), users can easily upload their PDF files and citations by using Mendeley. Furthermore, users can also easily be share information publicly or privately. According to Barsky (2010) &Fenner (2011), Mendeley usually provides both versions namely, desktop and web. A study by Hensley (2011) concluded that Mendeley includes importation of PDF metadata, automatic naming and filing of documents, opening of multiple PDF's in a single application which are navigable by tab, ability to highlight and finally annotate PDF's within the application.

EndNote: According to Rapp (2011), EndNote used by millions of researchers to locate and download full-text articles from the selected references, or group of references and it (EndNote) has more than 5000 bibliographic output styles. EndNote is a desktop application and it is widely used in the science. It allows researchers to save search strategies and also helps researchers in assisting with keeping a research log. According to Valentin (2009), EndNote is a commercial bibliographic management software and it can be used for site-licensed by the institutions or by the individuals and it was produced by Thomson Reuters and it was first released in 1988.

3. Methodology

The keywords used in this study are academic workload and quality ~~is~~ to import references from the Google Scholar to select the number of articles. The first article was picked up and used all the three reference management software such as EndNote, RefWorks, and Mendeley for referencing. Using these three software, the first article was imported. The article name was Academic Workload and Quality. All the three software were downloaded and installed in the desktop pc and the data was imported from the Google Scholar on the same article.

4. Results

Table 1 shows that reference management software such as EndNote, RefWorks, and Mendeley are very similar in terms of importing data from the Google Scholar. However, in some cases there are some differences where some of the software did not import fields such as Publisher, ISSN no., URL, and DOI. Results show that Mendeley import more data than other two software. Furthermore, it is noted that these three software, namely, EndNote, RefWorks, and Mendeley were downloaded from the Internet and

installed and finally used for the experiment to import for referencing from the Google Scholar without customizing or changing any application or selecting any options of the software. These software were used after downloading and installing directly from the Internet. This is summarized in Table 1 below:

Table 1: Imported and non-imported fields from the Google Scholar

Fields	EndNote	RefWorks	Mendeley
Author	1	1	1
Title	1	1	1
Year	1	1	1
Journal name	1	1	1
Volume no.	1	1	1
Issue no.	1	1	1
Pages	1	1	1
Publisher	2	1	2
ISSN no.	1	2	2
URL	2	2	1
DOI	2	2	1

1 represents Fields imported from the Google Scholar
2 represents Fields not imported from the Google Scholar

Figure 1: Comparison of All the Three Reference Management Software

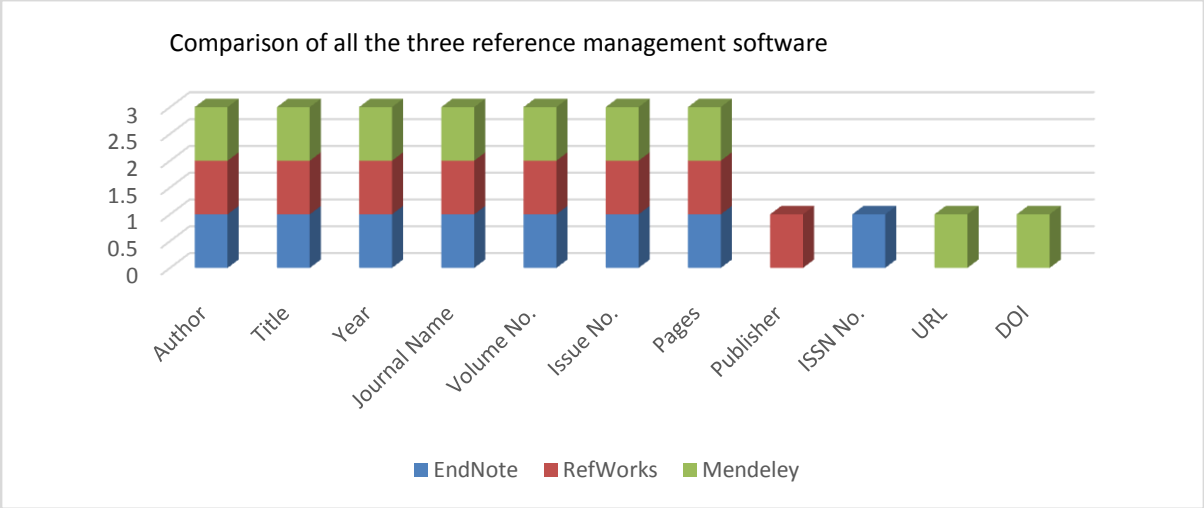
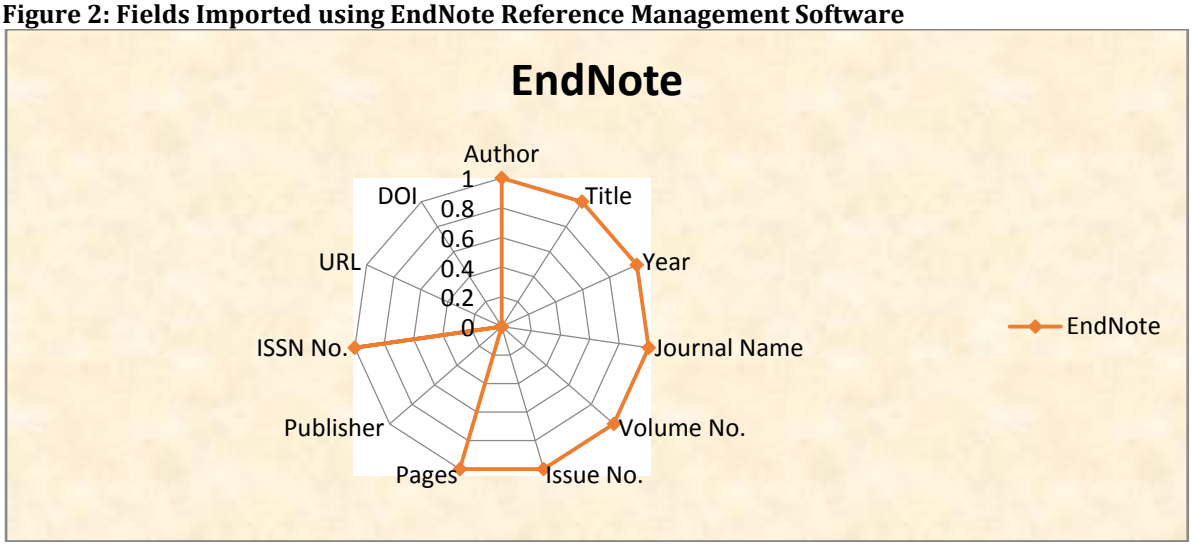


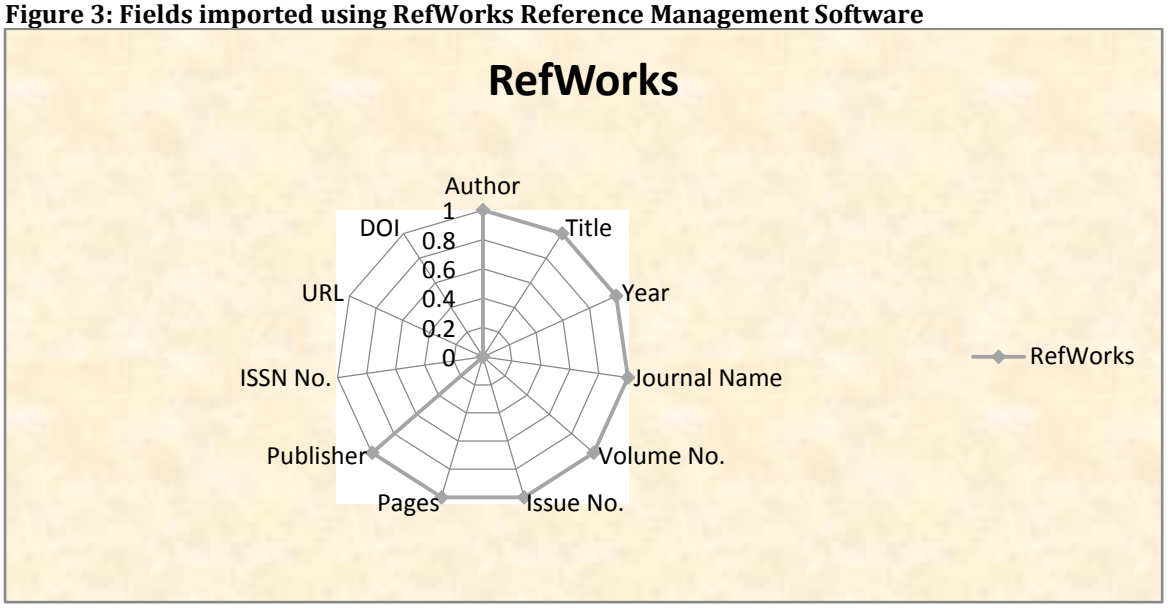
Figure 1 is represented in a graphical presentation of the comparison of EndNote, RefWorks, and Mendeley.

Figure 2: Fields Imported using EndNote Reference Management Software



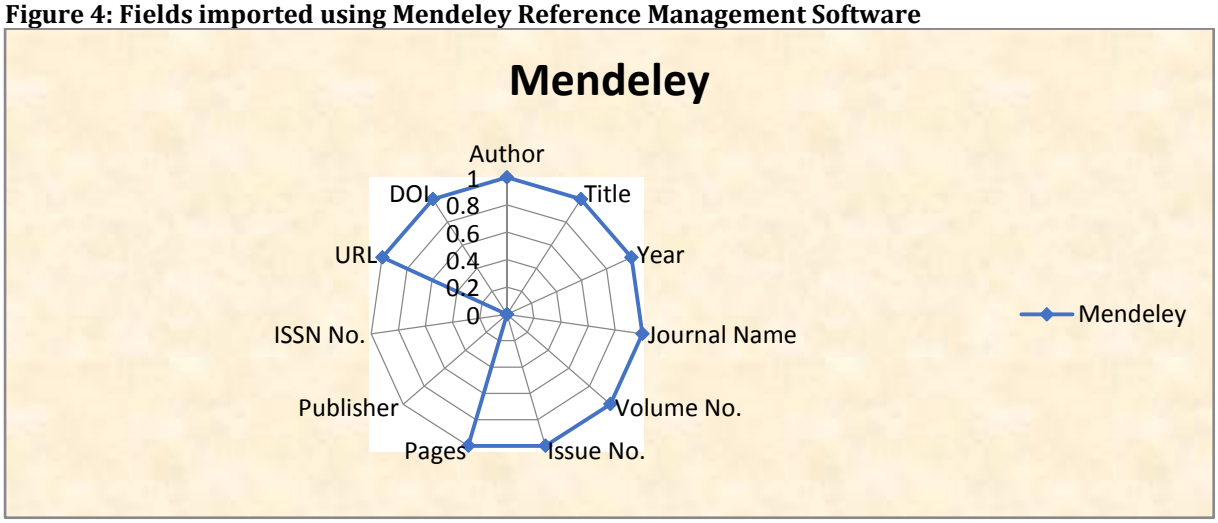
The figure 2 shows that EndNote did not import few important data from the Google Scholar. These important data are *Publisher*, *URL*, and *DOI.* On the other hand, figure 2 also shows using EndNote the following important data such as *Author*, *Title*, *Year*, *Journal Name*, *Volume No.*, *Issue No.*, *Pages*, *ISSN No.* have imported from the Google Scholar.

Figure 3: Fields imported using RefWorks Reference Management Software



The figure 3 shows that the RefWorks tool did not import few data such as *ISSN No.*, *URL*, and *DOI*. On the other hand, the figure 2 also clearly shows that the RefWorks have imported from the Google Scholar the following data: *Author*, *Title*, *Year*, *Journal Name*, *Volume No.*, *Issue No.*, *Pages*, and *Publisher*.

Figure 4: Fields imported using Mendeley Reference Management Software



The figure 4 shows Mendeley tool did not import few data from Google Scholar such as *ISSN No.* and *Publisher,* whereas Mendeley software has imported from the Google Scholar such as *Author*, *Title*, *Year*, *Journal Name*, *Volume No.*, *Issue No.*, *Pages*.

Discussion: The main objective of the study was to examine the software which can import accurately citations and references, the ease of use and also to identify the similarities of different fields of the different reference management software. Findings support Hensley (2011), where Hensley (2011) found that Mendeley reference management software can import PDF metadata, automatic naming and filing of document, opening of the multiple PDF's in a single application which are navigable by the tab, ability to highlight and finally annotate PDF's within application. While Valentin (2009) in his/her study stated that the EndNote is widely used by faculty, researchers, and by the students to collect, store, organize, manage

their references, images, and PDFs, insert references into the manuscripts, placing figures and tables in the word document or other documents.

5. Conclusion and Recommendation

This study has revealed that reference management software tool is widely used by researchers. And it also shows that reference management software can make more accurate referencing and citation than manual system~~s~~ among researchers because the quality of systematic review usually enhances the reference management tool usage. Results shows that the Mendeley reference management software can import more data from the Google Scholar. Based on the limited experiment, it has been concluded that the Mendeley reference management software looks as a useful tool for electronic reference management for researchers. This study will also help ~~to~~ researchers about the reference management software tool that is very essential in terms of citation and referencing. Therefore, the basic tenet of Hensley (2011) notion of the reference management software Mendley is matching with the findings I have in this study. Lastly, this study, however, recommends that researchers should use the reference management tool in terms of referencing and citation.

References

Adhikari, P. & Bhandari, S. (2011). Accuracy of References in Internet Journal of Medical Update. *Internet Journal of Medical Update*, 6(2), 47-49.

Aronsky, D., Ransom, J. & Robinson, K. (2005). Accuracy of References in Five Biomedical informatics Journals. *J Am Med Inform Assoc.*, 12(2), 225-228.

Borgman, C. L. (2003). From Gutenberg to the Global Information Infrastructure: Access to Informaiton in the Networked World. Cambridge, MA: MIT Press, (Cit. on p. 146). Print.

Bos, N. (2007). From Shared Databases to Communities of Practice: Taxonomy of Collaboratories. *Journal of Computed-Mediated Communication*, 12(2), (Cit. on p. 146). Print.

Brahmi, F. & Gall, C. (2006). EndNote and Research Manager Citation Formats Compared to Instructions to Authors in Top Medical Jouranls. *Medical Reference Services Quarterly*, 25(2), 49-57.

Barsky, E. (2010). Mendeley. Issues in science and technology. 2010. Librarianship 62 [Internet].[Cited 2011 Apr 18]. Available from http://www.istl.org/10-summer/electronic.html. Cited in Gilmour, R. & Cobus-Kuo, L. (2011). Reference Management Software: A Comparative Analysis of Four Products, Science and Technology Librarianship.

Best Evidence Medical Education (BEME). (2009). Guide for Topic Review Groups on Carrying Out BEME Systematic Review. Available from: www.bemecollaboration.org. as cited in King, R Hooper, B. & Wood, W. (2011). Using Bibliographic Software to Appraise and Code Data in Educational Systematic Review Research.*Medical Teacher*,33(9), 719-723.

Browne, R., Logan, P., Lee, M. & Torreggiani, W. (2004). The Accuracy of References in Manuscripts Submitted for Publication. Canadian Association of Radiologists journal. *Journal l'Association Canadienne Des Radiologistes*, 55(3), 170-173.

Buckley, S., Colema, J., Davison, I., Khan, K. S., Zamora, J. & Malick, S. (2009). The Educational Effects of Portfolios on Undergraduate Student Learning: A Best Evidence Medical Education (BEME) Systematic Review. BEME Guide No. 11. *Medical Teacher*, 31(4), 282-298.

Celayir, A., Sander, S. & Celayir S. (2003). Accuracy of References in the Pediatric Surgery Journals. *Journal of Pediatr Surgery*, 38(4), 653-654.

Curry, M. & Gray, J. (2008). BibPort: Creating Bibliographic References. *Dr DOBBS Journal*, 33(2), 30.

De Lacey, G., Record, C. & Wade, J. (1985) How Accurate Are Quotations and References in Medical Journals? *British Medical Journal*, 291(6499), 884-886.

Dornan, T., Littlewood, S., Margolis, S. A., Scherpbier, A., Spencer, J. & Ypinazar, V. (2006). How Can Experience in Clinical and Community Settings Contribute to Early Medical Education?. A BEME Systematic review. *Medical Teacher*, 28(1), 3-18.

Eapen, B. (2006). EndNote. *Indian Journal of Dermatology Venereology and Leprology*, 72, 165-166.

Egger, M., Smith, G. D. & Altman, D. G. (n. d). *Systematic Reviews in Health Care*. 1st ed. London, BMJ Publishing Group.

EndNote 9.0. Thomson Researchsoft, 1998-2005.

EndNote Application story: Thomson. (n. d). researchsoft. (Accessed at http://www.endnote.com/enapplication_note.asp.).

Evans, J. T. Nadjari, H. I. & Burchell, S. A. (1990). Quotational and Reference Accuracy in Surgical Journals: A Continuing Peer Review Problem. JAMA, 263(10), 1353-1354.

Fourie, I. (2011). Librarians Alert: How Can We Exploit What Is Happening with Personal Information Management (PIM), Reference Management and Related Issues? *Library Hi Tech*, 29(3), 550-556. (Cit. on p. 146). Print.

Faunce, G. J. & Soames, J. R. (2001). The Accuracy of Reference Lists in Five Experimental Psychology Journals. *American Psychologist*, 56(10), 829-830.

Fenner, M. (2011). Interview With Victor Henning From Mendeley [Internet]. [Cited 2011 Apr]. Available from http://blogs.nature.com/mfenner/2008/09/05/interview-with-victory-henning-from-mendeley.2008. Cited in Gilmour, R. Cobus-Kuo, L. (2011). Reference Management Software: A Comparative Analysis of Four Products. Science and Technology Librarianship.

Fitzgibbons, M. & Meert, D. (2010). Are Bibliographic Management Software Search Interfaces Reliable?: A Comparison Between Search Results Obtained Using Database Interfaces and The EndNote Online Search Function. *The Journal of Academic Librarianship*, 36(2), 144-150.

Francese, E. (2012). Reference Management Software As Digital Libraries: A Survey at the University of Torino.

Francese, E. (2013). Usage of Reference Management Software at the University of Torino. *JLIS.it*, 4(2), 145-173.

Gatten, R. (2010). A Case Study in Reference List Accuracy. *New Library World*, 111(1/2), 16-25.

Gilmour, R. & Cobus-Kuo, L. (2011). Reference Management Software: A Comparative Analysis of Four Products. *Issues in Science and Technology Librarianship*, 66(66), 63-75.

Haig, A. & Dozier, M. (2003a). Systematic Searching for Evidence in Medical Education-part 1: Source of Information. *BEME Guide no. 3, Medical Teacher*, 25(4), 352-363.

Haig, A. & Dozier, M. (2003b). Systematic Searching for Evidence in Medical Education-part2: constructing searches. *BEME Guide no. 3, Medical Teacher*, 25(5), 463-484.

Hammick, M., Dornan, T. & Steinert, Y. (2010). Conducting A Best Evidence Systematic Review. Part 1: From idea to data coding. *BEME Guide No. 13, Medical Teacher*, 32(1), 3-15.

Hensley, M. K. (2011). Citation Management Software. *Reference and User Services Quarterly*, 50(3), 204-208.

Hernon, P. & Metoyer-Duran, C. (1992). Literature Reviews and Inaccurate Referencing: An Exploratory Study Of Academic Librarians. *College and Research Libraries*, 53(6), 499-512.

Hinchcliff, K., Bruce, N., Powers, J. & Kipp M.(1993). Accuracy of References and Quotations In Veterinary Journals. *Journal of the American Veterinary Medical Association*, 202(3), 397-400.

International Committee of Medical Journal Editors. (1999). Uniform Requirements for Manuscripts Submitted TO Biomedical Journals. *Medical Education*, 33, 66-78.

Jisc & Open University. (2010). Telstar (Technology Enhanced Learning supporting STudents to achieve Academic Rigour) Project.

Jose, S. & Jayakanth, F. (2008). A Web-based Open Source Software for Managing the Bibliographic References. *Journal of Information Science and Technology*, 1(1), 1-11.

King, R., Hooper, B. & Wood, W. (2011) Using Bibliographic Software to Appraise and Code Data in Educational Systematic Review Research. *Medical Teacher*, 33(9), 719-723.

Lorenzetti, D. L. & Ghali, W. A. (2013). Reference Management Software for Systematic Reviews and Meta-analyses: An Exploration of Usage and Usability. *BMC Medical Research Methodology*, 13(1), 141.

Mohammad, A. E. & Laskin, D. M. (2008) Citation Accuracy in the Oral and Maxillofacial Surgery Literature. *Journal of Oral and Maxillofacial Surgery*, 66(1), 3-6.

Nashelsky, J. & Earley, D. (1991). Reference Management Software: Selection and Uses. *Library Software Review*, 10(3), 174-178.

O'Connor, L. G. & Kristof, C. (2001). Verify Your Citations: Accuracy of Reference Citations in Twelve Business and Economics Journals. *Journal of Business and Finance Librarianship*, 6(4), 23-40.

Orlin, W., Pehling, J. & Pogrel, M. A. (1996). Do Authors Check Their References?: A Survey of 500 References From the Journal of Oral and Maxillofacial Surgery. *Journal of Oral and Maxillofacial Surgery*, 54(2), 200-202.

Rapp, D. (2011). Product Watch: Reference Management Tools. Library Journal, Available from: lj.libraryjournal.com/2011/11/academic-libraries/product-watch-reference-management-tools/.

Reddy, M., Srinivas, S., Sabanayagam, N. & Balasubramanian, S. (2008). Accuracy of References in General Surgical Journals—An Old Problem Revisited. *The Surgeon*, 6(2), 71-75.

Reiss, M. & Reiss, G. (2002). EndNote 5 Reference Manager-Functions-Improvements-Personal Experiences, 91(40), 1645-1650.

Reeves, S., Koppel, I., Barr, H., Freeth, D. & Hammick, M. (2002) Twelve Tips for Undertaking A Systematic Review. *Medical Teacher*, 24(4), 358-363.

Senarath, U. (2007). Bibliographic Referencing Made Easy: Use Of Bibliographic Software in Health Research. *Ceylon Medical Journal*, 52(1), 38-39.

Shaplaned, M. (1999). Evaluation of Reference Management Software on NT (Comparing Papyrus with Procite, Reference Manager, Endnote, Citation, Getaref, Biblioscape, Library Master, Bibliographica, Scribe, Refs) University of Bristol, (Accessed at http://eis.bris.ac.uk/~ccms/meval99.htm.).

Steele, S. E. (2008). Bibliographic Citation Management Software As A Tool For Building Knowledge. *Journal of Wound Ostomy and Continence Nursing*, 35(5), 463-468.

Valentin. A Review of the Main Reference Management Software. Medpedia. (December 4, 2009). Available: http://www.medpedia.com/new_analysis/241-Knowledge-beyond-words/entries/15819-A-Review-of-the-Main-Reference-Management-Softwares. Accessed: June 14, 2001. Cited in Zhang, Y. (2012). Comparison of Select Reference Management Tools. Medical Reference Services Quarterly, 31(1), 45-60, DOI: 10.1080/02763869.2012.641841

Voss, A. & Procter, R (2009). Virtual Research Environments in Scholarly Work and Communications. *Library Hi Tech*, 27(2), 174-190. (Cit. on p. 146). Print.

Wager, E. & Middleton, P. (2002). Effects of Technical Editing In Biomedical Journals: A Systematic Review. *Jama*, 287(21), 2821-2824.